For Reference

NOT TO BE TAKEN FROM THIS ROOM

For Reference

NOT TO BE TAKEN FROM THIS ROOM

Ex libris
Universitatis
Albertaensis

UNIVERSITY OF ALBERTA
QUAECUMQUE VERA

Digitized by the Internet Archive
in 2019 with funding from
University of Alberta Libraries

https://archive.org/details/Valle1966

1966 (F)
#181

UNIVERSITY OF ALBERTA

THE PUPILLARY RESPONSE AS A FUNCTION OF SEXUAL INTEREST

by

ALBERT B. VALLE

A DISSERTATION
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF MASTER OF SCIENCE

DEPARTMENT OF PSYCHOLOGY
EDMONTON, ALBERTA
July, 1966

UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a dissertation entitled "The Pupillary Response as a Function of Sexual Interest", submitted by Albert B. Valle in partial fulfillment of the requirements for the degree of Master of Science.

ABSTRACT

The present study was designed as a methodological approach to the measurement of sexual interests using a strict operationism.

Sexual interest was defined in terms of "time of viewing", MMPI Mf scores, and pupillary responses to pictures of nude males and females.

Each of the above variables was investigated in a sample of Married and Single males obtained from a University population, and a group of fixed, overt Homosexuals.

Under two viewing conditions, Married and Single males looked significantly longer at pictures of semi-nude females, while Homosexuals looked significantly longer at pictures of semi-nude males than females.

Homoxexual males obtained significantly higher MMPI Mf scores than Married and Single males.

Homosexual males demonstrated a significant increase in mean pupillary diameter to pictures of nude males than females. Married and Single males demonstrated no significant difference in mean pupillary diameter to pictures of male and female nudes.

Major emphasis is placed on the pupillary response as an autonomic correlate of interest. In terms of reinforcement theory, it is hypothesized that the pupillary response is a conditioned respondent and that in relation to sexual interests, conditioning of this response may occur at a critical period of development.

ACKNOWLEDGMENTS

This paper is dedicated to Dr. W.A.S. Smith in acknowledgment of his six years as a reinforcer.

The author wishes to thank Mr. Paul DeGroot for his technical assistance in the construction of the pupillary response apparatus.

Acknowledgment is also extended to Mr. A.C. who provided invaluable assistance to the author in securing the assistance of the homosexual sample.

TABLE OF CONTENTS

Page

INTRODUCTION 1

THE ORIENTING RESPONSE 7

PHYSIOLOGY OF THE PUPILLARY RESPONSE .. 9

HYPOTHESES 12

PROCEDURE

METHOD 14

PROCEDURE AND APPARATUS 17

MEASUREMENT AND SCORING 19

STIMULI 20

RESULTS 26

DISCUSSION 37

REFERENCES 43

APPENDICES 45

LIST OF TABLES

Table		Page
1	Condition A: Mean time in seconds and standard deviations for viewing semi-nude pictures	26
2	Condition A: Significance scores between mean differences in viewing times, semi-nude males-females	27
3	Condition B: Mean time in seconds and standard deviation scores for viewing semi-nude slides	28
4	Condition B: Significance scores between mean differences on viewing times, semi-nude males-females	28
5	Mean _Mf_ Scores	29
6	Significance of differences of _Mf_ scores of each group	29
7	Pupil size increases or decreases when comparing stimuli to controls expressed in percentage totals	31
8	Significance of Differences between Mean Increases in Pupillary Diameter..	35

LIST OF FIGURES

Figure		Page
1	Married Males	32
2	Single Males	33
3	Homosexual Males	34

LIST OF APPENDICES

Appendix		Page
A	Letter to all Subjects (except Homosexuals) after signup	45
B	Photographs of viewing Apparatus	47
	View A	48
	View B	49
	View C	50
	View D	51
C	Slide Content Set A ..	52
D	Slide Content Set B ..	53
E	Slide Content Set C ..	54
F	Questionnaire re sexual interests of Subjects ..	55

INTRODUCTION

The primary purpose of this study is to consider a methodological approach to the measurement of "interests". Particular emphasis is placed on the measurement of sexual interests using an operational approach.

In considering the various approaches to the measurement of interests, one operation which might be used in an investigation with human subjects is to simply ask them about their interests. However, as Anastasi (1961) has indicated, subjects' answers to direct questions regarding their interests are "often unreliable, superficial, and unrealistic" (p. 529).

In order to compensate for such deficiencies, paper and pencil inventories such as the Strong Vocational Interest Blank and Kuder Preference Record have been developed. Although the interests which humans may manifest are potentially infinite, present test development is primarily oriented towards vocational testing and counselling purposes.

Another major area of research has been concerned with paper and pencil inventories designed to identify sexual or masculinity-femininity interest patterns (Anastasi, 1961). One such scale, Scale 5 or the _Mf_ scale of the MMPI, has been the subject of considerable controversy. Although the _Mf_ scale appears to have been specifically designed to identify male sexual inversion, there has been considerable controversy regarding the use and interpretation of this scale. In spite of the obvious inadequacies associated with the construction of the _Mf_ scale (the criterion group consisted of 13 male

homosexuals), certain clinicians continue to suggest that it may be of value in determinining homoerotic preferences in men (Dahlstrom & Walsh, 1960). There are, however, contradictory observations reported in the literature. Thus there is a general caution exercised in interpreting the *Mf* scale. This is particularly true in a college population where the "mean score across the country ranged from a half to one standard deviation above the mean for Minnesota men in general in the direction of greater femininity" (Dahlstrom & Welsh, 1960).

Although the paper and pencil inventory has been the standard procedure for obtaining a measure of "interest", there has been within recent years activity in the investigation of the pupillary response as a physiological correlate of interest.

Hess and Polt (1960) and more recently Hess (1964, 1965a, 1965b) have reported that increases in the size of the pupil of the eye have been found to accompany the viewing of emotionally toned or interesting visual stimuli.

In their initial study, Hess and Polt (1960) tested the hypothesis that pupillary changes could be used in humans as both a quantitative and qualitative measure of the interest value of visual stimuli. Their procedure consisted of the presentation of a series of test pictures, alternated with a control pattern, during which photographs of the subject's eyes were obtained on 16mm. film. Bright-

ness was kept relatively constant in an attempt to eliminate any effect of changes of illumination on the size of the pupil. Differences in pupillary size were measured by projecting the film using a "Percepto-Scope", or by simply projecting the film and measuring with a ruler, expressing the differences in terms of mean changes in pupillary diameter. In this preliminary experiment, the authors found a clear sexual dichotomy in regard to the interest value of the visual stimuli used. Reliability of the procedure after an interval of one day was reported to be significant at $P < .01$.

The authors also reported that "differences in interest value of the various stimuli may be discerned within as well as between the sexes".

With more specific concern for the measurement of sexual interests, Hess, Seltzer and Shlien (1965), in a pilot study, reported that the pupillary response of each subject in a group of heterosexuals was greater when looking at opposite-sex pictures than at same sex pictures, the reverse being true of homosexual subjects. In this study, the measurement of changes in pupillary diameter provided a clear-cut basis for discriminating between the two groups. No information is provided regarding the reliability of the procedure, and in addition the number of subjects in each group was small ($N = 5$ for each group).

Another technique for measuring interest has been suggested by Skinner (1953). He suggests that a direct inventory of a subject's interests might be made by showing the subject an assortment of pictures and recording the time he spends looking at each picture. As Skinner feels that "one who readily engages in a given activity is not showing an interest, he is showing the effects of reinforcement" (Skinner, 1953, p. 72), presumably looking at a picture is reinforced by what is seen and the time that a subject spends in looking will vary as a function of the reinforcement value of each picture, i.e., some pictures will be more reinforcing than others. However, no data supporting this statement has been offered by Skinner.

A study utilizing a similar technique to the above was reported by Zamansky (1958, 1965) in experiments designed to investigate the psychoanalytic hypothesis that paranoid subjects have strong but unacceptable homosexual tendencies. Zamansky had his subjects look at pictures of humans (male and female) and objects. He found that overt homosexual males, when compared to normal males, will spend a greater proportion of time looking at a picture of a man than at a picture of a woman, and that overt homosexual males, when compared to normal males, will manifest a greater attraction to pictures of men than to neutral (non-human) objects. He demonstrated similar differences

with regard to paranoid and non-paranoid psychotics, paranoids tending to look longer at pictures of males.

Zamansky's study does appear to be of some value in that it provides an operational approach to the measurement of interest, i.e., the amount of time a subject spends in looking at various types of pictures of different content. It might also serve as a more overt index of interest which could then be correlated with a convert index, such as the pupillary response. A disadvantage of this procedure however is that as a function of the "threatening" or aversive properties of the visual stimuli, subjects could theoretically conceal their actual interests by avoiding those pictures which are truely interesting or reinforcing. Indeed, on the basis of recent studies of the pupillary response as a measure of interest, as reported in a leading popular magazine (Davidson, 1966), it appears as if the pupillary response correlates more positively with overt behavior than with verbally expressed attitudes or statements.

This last point raises a question regarding the validity of certain measures of interests due to the ability of the subject to conceal his interests or to "fake" his responses. One of the major criticisms of the Mf scale of the MMPI is that several of the items contain direct statements regarding sexual activity, preferences, and preoccupation, which allow the individual to easily raise or lower his score on this scale. It is also possible that when utilizing

a technique similar to that suggested by Skinner, a subject could conceal his interests as a function of the nature of the stimuli, particularly if the stimuli are "threatening" or aversive.

The ability to fake a more covert response such as the pupillary response would appear to be extremely unlikely as a function of its physiological basis.

On the basis of the research that has been done to date, there appears to be sufficient data to consider the pupillary response as an autonomic correlate of interest. If the procedure for measuring the pupillary response is demonstrated to have both adequate reliability and validity, then it would be not only of great practical value but would appear to have theoretical significance. The next section of this report addresses itself to the relevance of contemporary psychological theory to these measures of interest, particularly when considered in the light of recent work regarding the Orienting Response as discussed by Berlyne (1960) and Razran (1961).

THE ORIENTING RESPONSE

Pupillary dilation is considered a major component of the Orienting Response (Berlyne, 1960). "The Orienting Reflex is the organism's first reaction to any adequate normal stimulus" (Razran, 1961). Razran points out however that a stimulus can elicit Orienting Reflex activity for only a limited number of presentations "... after which the stimulus either evokes no reaction at all or a reaction that is different from an Orienting Reflex" (Razran, 1961).

It has been demonstrated that the Orienting Reflex may be difficult to extinguish, and that the reinforceability of the Orienting Reflex refers to the fact that it may be strengthened through some event similar to that involved in operant conditioning. Razran points out however, that the Orienting Reflex could not readily be conceived of as an operant (in reinforcement theory, however, certain of the Orienting Response components could readily be considered as respondent behavior). Razran cites an experiment with fox cubs who, in the stimulus situation listened to the squeaks of mice. Initially, the squeaks evoked clear Orienting Responses which extinguished rather quickly upon repetition. If however, the fox cubs were permitted to eat the mice "one meal sufficed to make the Orienting Responses to the squeaks almost inextinguishable" (Razran, 1961).

An increase in pupillary diameter is a major component of the Orienting Response. In the context of reinforcement

theory the pupillary response can be considered as respondent behavior. With particular reference to sexual stimuli, consider the following: assume that during development, upon presentation of a new or novel situation involving sexual stimuli, or stimulation, the pupillary response is elicited in association with other of the Orienting Response components. Assume further that through some mechanism of reinforcement this response becomes conditioned to that particular situation, or through stimulus generalization, to similar stimuli or situations. In an experimental situation then, if heterosexual males were shown pictures of nude females, there should be a definite increase in pupillary diameter to these stimuli. However as the pupillary response could be elicited by any new or novel stimulus, we would predict that in a situation where hetero- and homosexual subjects were shown slides or pictures of both male and female nudes, heterosexual males should initially show an increase in pupillary diameter to males and homosexual subjects should show an initial increase in pupillary diameter to females, but that these initial responses would quickly extinguish, or diminish, and that the two groups could be distinguished on the basis of a stable pupillary response to the preferred stimulus.

In the above, the pupillary response has been referred to, within the context of reinforcement theory, as a respondent. Physiologically, the iris is representative of all smooth-muscle structures innervated by the

autonomic nervous system, consequently this would justify its inclusion in the "respondent" class of behaviors. Respondent behavior is closely associated with "emotional" behavior and since it has been suggested that the pupillary response may be an autonomic correlate of "interest", the following review of the physiology of the pupillary response is presented with particular reference to "emotional" states.

Physiology of the Pupillary Response

The iris, composed of two muscles, controls the diameter of the pupil of the eye. The *sphincter pupillae* is composed of an annular band of smooth-muscle fibers which encircles the pupil and is responsible for contraction of the pupil. Pupillary contraction may be very dramatic as within a few seconds the pupil may decrease from about 8mm (in darkness) to 2mm upon light stimulation. The *sphincter pupillae* is activated by parasympathetic (cholinergic) fibers from the ciliary ganglion (Davson, 1962).

The *dilator pupillae* controls dilation of the pupil and is innervated by sympathetic (adrenergic) fibers from the superior cervical ganglion. Thus, through reciprocal innervation by the parasympathetic and sympathetic tracts the iris is representative of all smooth-muscle structures innervated by the autonomic nervous system.

Physiological investigation has demonstrated that at least four factors or operations are involved in pupillary

dilation, two due to neural mechanisms and two due to humoral mechanisms (Davson, 1962).

The neural mechanisms appear to involve: (a) active sympathetic discharges which reach the dilator pupillae and cause it to contract, and (b) inhibitory impulses which cause the sphincter pupillae to relax.

The operation of humoral factors is related to observations that physical and emotional stress are known to stimulate adrenal output (Cannon, 1929) and that pupillary dilation is a common resultant. However, there is apparently an additional but as yet unidentified humoral factor involved in dilation, as dilation of the pupil can occur within 2-3 seconds of stimulation, a period of time considered to be much too short for circulating adrenalin to reach the eye.

There is considerable evidence to indicate that in addition to its prime function of regulating the amount of light entering the eye (the degree of pupillary constriction/dilation being a function of the amount of illumination present), the pupillary response to emotional or psychological stimuli can be quite intense. "Psychic influences are potent. Surprise, fear, and pain dilate the pupil markedly ... sustained dilation of the pupil may occur in the presence of any emotion. Psychic dilation can be brought about by almost any strong emotion, pleasant or unpleasant, but it is most characteristic of anxiety or fear" (Adler, 1959).

Further evidence of the responsiveness of the pupil is provided by Davson (1962). In discussing pupillary motion, he points out that shifts in the size of the pupil can be caused by "... spontaneous or reactive changes in the level of consciousness, or neurologically speaking, changes in the degree of corticothalamo-hypothalamic activity. Such activity is increased by sensory or emotional stimulation or by spontaneous thoughts or emotions.

HYPOTHESES

This study was designed to investigate certain methodological approaches to the measurement of sexual interests. Of primary concern was the validity of the pupillary response as a measure of sexual interest and the gathering of correlational evidence from questionnaire data and from measures of "time of viewing". The following operational hypotheses were tested:

(1) When viewing slides of semi-nude males and females, heterosexual males will look significantly longer at slides of females than males.

(2) When viewing slides of semi-nude males and females, homosexual males will look significantly longer at slides of males than females.

(3) Heterosexual males, when asked to view slides of semi-nude males and females for approximately fifteen seconds, will look longer at females.

(4) Homosexual males, when asked to view slides of semi-nude males and females for approximately fifteen seconds, will look longer at males.

(5) There will be no significant difference between a sample of University students and Homosexual males on the basis of their raw scores on the *Mf* scale of the MMPI.

(6) When viewing slides of nude males and females, heterosexual males will demonstrate a greater increase in mean pupillary diameter to females than to males.

(7) When viewing slides of nude males and females, homosexual males will demonstrate a greater increase in mean pupillary diameter to males than to females.

METHOD

Subjects

A total of eighty-four subjects were tested for this study although as a result of technical problems which were encountered, the number of subjects providing data for any one procedure are reported separately.

In order to correlate and test the validity of the various measures used in this study to assess sexual interests, subjects whose sexual behavior was known and established served in the criterion groups.

In order to establish the criterion groups, the following procedure was used; the first group consisted of overt, fixed homosexuals. Subjects who comprised this group were included only, if on the basis of their overt behavior, they were known to repeatedly engage in sexual activities with members of the same sex. It should be noted that inclusion into this group did not necessarily mean that the subjects had never experienced a heterosexual relationship, but that homosexual behavior was the preferred and predominant behavior.

In an attempt to acquire and evaluate more specific information regarding the sexual behavior of all subjects, each subject completed a questionnaire which was based on Kinsey's rating scale (Kinsey, et. al., 1948). A more detailed description and discussion of the questionnaire will be presented later. It should be noted, however, that all

of the homosexual subjects obtained ratings indicating exclusive or almost exclusive homosexual behavior and/or interests.

The second criterion group, the Heterosexual sample, consisted of married males who initially served as the primary source of subjects for this sample. Inclusion into this group did not necessarily imply complete heterosexuality, and here again the questionnaire provided valuable information in helping to define the heterosexual sample. Additional heterosexual, or at least self-stated non-homosexual subjects were obtained from a third group composed of Single males.

The Married and Single males were obtained from a large pool of available subjects in an introductory psychology course. They could not be considered a random sample of psychology students. The initial announcement for subjects implied that this was not a typical psychological study since it was noted that subjects had to be at least 18 years of age and that they would be guaranteed complete annonymity. Approximately twenty per cent of the entire male population of this introductory class (100 students) signed up for participation.

A major variable of concern in this study was the necessity for establishing and maintaining ethical standards and practices, not only with regard to the annonymity of the subjects but also in relation to the experimental situation

itself. As a consequence certain variables which might have demanded more scientific control had to be weighed against any potential psychological embarrassment to the subjects. It was anticipated that on a chance basis some of the students would have strong concern over homosexual feelings or behavior which might be elicited by the experimental situation. Extra precautions were taken to provide enough information to the subjects before the actual exposure to the slides so that they could withdraw from participation if they so chose. In addition, at the end of the experimental session, subjects were invited to ask any questions they wished and all questions were answered as directly as possible.

The subjects were obtained from the following sources and in the following manner:

(A) University Sample. The following announcement was read by the Experimenter to each of three large sections of an introductory psychology course at the first class meeting:

> "I am presently conducting a study which requires twenty-five married males and twenty-five single males. If you are willing to participate, this study will provide you with five of the required six hours of subject experimentation time. Due to various factors which I cannot reveal to you at this time, all subjects must be at least 18 years of age. In addition, all subjects will be guaranteed complete annonymity. If you are willing to participate please stop by the Department of Psychology office and ask for the Departmental Secretary who will take your name. The

> secretary is not aware of the nature of this study. All subjects will be given further information at the first experimental session."

(B) Homosexual Sample. All of the Homosexual subjects were obtained with the help of a respected member of the local homosexual community. Subjects had to fit the following criteria to be included in the Homosexual sample: (a) they had to be known as overt homosexuals, and (b) their overt behavior conformed to the definition of the homosexual as proposed by Bieber (1965), i.e. individuals, who in adult life, repeatedly engage in sexual activities with members of the same sex. Similar assurances regarding annonymity were given to these subjects.

Procedure and Apparatus

After the initial sign-up, all subjects (except homosexuals) were contacted by means of a letter from the Experimenter (Appendix A) and arrangements were made for them to participate in the administration of the Group Form of the MMPI on one of three evenings. Subjects were assigned code numbers at the time of administration of the MMPI.

Due to time factors, and the difficulty in obtaining homosexual subjects, they were given the Group Form booklet of the MMPI and allowed to complete it at home, returning the forms to the Experimenter by mail.

The viewing apparatus was a plywood constructed box with an opening at one end large enough to admit the head of the subject who rested his chin on a foam rubber pad. Photographs of the apparatus are contained in Appendix B.

Resting the chin on the pad, the subject faced a rearview projection screen set at a distance of 24 1/2 inches from his eyes. A 35 mm. Kodak Carousel 500 slide projector, at a distance of 41 3/4 inches from the screen, projected the slides onto the screen.

During Conditions A and B, experimental Conditions in which the subjects were first instructed to look at a series of semi-nude slides for (a) as long as they were interested, and (b) for approximately fifteen seconds, the subject controlled the presentation of the slides by using a remote unit which was attached to the projector. During Condition C, the experimental Condition which allowed for filming of the pupil, changing of the slides was automatically controlled by a repeat-cycle timer, each slide being projected on the screen for ten seconds. A Beauleau 16R movie camera with a 50mm. lens was locked in position on one side of the viewing apparatus and the timer and camera action was initiated simultaneously by the Experimenter. As the slides were being viewed, during Condition C, a half-silver mirror placed at a 45 degree angle in the viewing apparatus and across the subject's line of vision permitted filming of the eye at a rate of two frames per second. Illumination for the photography was provided by a 100-watt bulb on rheostat control which was

placed on the bottom center of the apparatus, an area under subject's chin. The level of illumination was constant for all subjects and the projector's High-Power lamp was utilized for each subject.

Measurement and Scoring

The processed 16 mm. film was projected, frame by frame, onto a white screen using a 16 mm. film strip projector. The distance from the projector to the screen was twenty inches and provided a magnification of approximately twenty times. The diameter of the pupil was measured at its widest point for each measurable frame with a millimeter ruler and recorded, providing a set of twenty measurements for each Control and Critical slide. A Control slide was a medium grey slide with numbers 1 to 5. A Critical slide was either a scenic picture or a slide of a nude male or female. Averages were then computed for each Critical picture and for each preceding Control slide. The percentage of increase or decrease in average pupil size was computed by dividing the difference between critical average and control average by the control average. A positive percentage indicated a larger pupil size when the subject was viewing the Critical stimulus than when he viewed the preceding Control. A negative percentage meant a smaller average pupil size during the viewing of the Critical stimulus as compared to the preceding Control. For each subject, the six percentages of his reponse to the

male pictures were added together to give his Total Response to Male Pictures score (Table 11, first column). Similarly, the addition of the percentages of the six female pictures gave his Total Response to Female Pictures (Table 11, second column). The algebraic subtraction of each subject's male picture total from his female picture total (column two minus column one, Table II) gave each subjects male-female response measure (Table II, column three). A positive figure in the third column of Table II would indicate that the subject had a greater total response to pictures of females than to pictures of males; a negative figure would indicate that the subject had a greater total response to pictures of males than to pictures of females.

Stimuli

1. Set A (used for Conditions A and B). The slides were of pictures taken from magazines which featured pictures of semi-nude male and female models. The only qualification for inclusion was that the genitals of either the males or females could not be clearly visible (i.e. had to be covered with a bathing suit, posing strap, etc.). A description of the thirty slides which composed Set A, in order of their presentation, is presented in Appendix C.

2. Sets B and C. These two sets consisted of thirty slides each, fifteen Control slides, three "neutral" slides, six nude males and six nude females.

Each of the neutral and nude slides was preceded by a medium grey Control slide.

It has been reported that there is an initially large pupillary response to the initial slides, thus the first three "Critical" slides were pictures of mountains.

In order to control for level of illumination, each slide was measured with a Weston Illumination Meter, Model 756, and a reading in foot candles taken. To equate each Critical slide with its Control slide, if necessary, commercially available "Addacolor" gelatin filters were used. A description of the slides in each of these sets, with the slides listed in order of presentation, is presented in Appendices D and E. All of the nude slides were of pictures taken from Nudist magazines; a few were individually purchased. With the exception of the "Neutral" slides, the order of presentation of the nude slides was randomly assigned as to sex.

The Subjects met with the Experimenter individually by appointment and were taken into the experimental room. They were seated at a table and introduced to the study with the following:

> "Today you begin the next stage of this study. However due to the nature of the study I must ask you to sign this form which states that you will not reveal any details of this study until you have been notified that it has been completed. After you sign the form I will explain what will be involved and if you wish you may withdraw. However even if you choose to withdraw I must have your assurance that you will not discuss any aspects of the study until you have been notified that it has been completed."

The Subject signed the form and it was placed in an envelope and sealed and the Subject was assured that it would be destroyed at the completed of the study. The Homosexual subjects were not asked to sign the above-mentioned form. After the Subject had signed the form, the following instructions were given:

> "Before continuing, I would like you to tell me if you have any objections to viewing slides of nudes or semi-nudes. If you have any objections for any reason please feel free to withdraw from the study at this point. Also, a little later you will be asked to answer a questionnaire which has some rather personal questions regarding your sexual behavior, consequently if you have any objections to this you may also feel free to withdraw from the study."

Homosexual subjects were not given the above instructions as they knew before participating that this study involved the viewing of semi-nude and nude pictures of males and females.

If the Subject agreed to participate he was then seated in front of the viewing apparatus and given the following instructions:

CONDITION A

> "I now want you to look at the screen and look at a series of slides. LOOK AT EACH PICTURE AS LONG AS YOU ARE INTERESTED IN IT. You will control the presentation of the slides with this remote control unit. For example, LOOK AT EACH SLIDE AS LONG AS YOU ARE INTERESTED IN IT and when you wish to change to the next slide simply press this button. Several of the slides may be slightly out of focus, however do not worry about the focusing. I will give you the signal to begin."

If necessary, the instructions were repeated. The Experimenter then prepared the slide tray, turned the projection lamp on and instructed the Subject to begin. While the Subject viewed the slides, the Experimenter, using a stop watch, timed the viewing of each slide to the nearest half-second. When the subject had completed the viewing of the thirty slides of Set A, the projector bulb was turned off, the slide tray re-set, and the following instructions given:

CONDITION B

> "I would now like you to look at the slides again, but this time I want you to LOOK AT EACH SLIDE FOR APPROXIMATELY FIFTEEN SECONDS. Again, you will control the presentation of the slides with the remote control unit. It is important that you look at each slide for approximately fifteen seconds. I will give you the signal to begin."

The Experimenter then turned the projector bulb on, gave the signal to begin, and again timed the viewing of each slide to the nearest half-second.

Upon completion of the above (Conditions A and B) the Subject was told that there would be a pause while the Experimenter adjusted the apparatus for the next procedure. During this time he was given and asked to complete the Behavior Questionnaire (Appendix F). Although the instructions were contained on the Questionnaire, the Experimenter pointed out to the Subject that he was to read each of the statements and to put a circle around the number and/or letter of any of the statements that might apply to him. While the Subject

completed the Questionnaire, the Experimenter placed a new slide tray on the projector, adjusted the rheostat controlled light source and made any necessary adjustments to the camera. If the Subject was still working on the Questionnaire when the Experimenter had finished the preparations, the Experimenter left the room for a short period, returning when the Subject had finished.

When the Subject had completed the Questionnaire he was again seated at the viewing apparatus and given the following instructions:

CONDITION C

> "This time I would like you to rest your chin on this pad and look straight at the screen. You will be shown another series of slides. However, this time they will be presented automatically. Before each slide of a nude you will see a slide like this with the numbers one to five (before seating the subject the Experimenter turned the projector bulb on, illuminating the first Control slide). Look at the number five in the center for as long as the slide is on the screen. Do this for each slide with the numbers. When the slide of the nude comes on you may look wherever you wish".

The instructions were repeated if necessary, then the Subject rested his chin on the pad and the Experimenter made any necessary adjustments to the camera. When this was completed the Experimenter turned on the timing mechanism for the projector and the camera simultaneously.

Following the presentation of the slides of Set B, a five minute break was taken. Following this period the Subject was again seated at the viewing apparatus and

given the following instructions:

> "This time the procedure is identical except that you will see a different series of slides. Remember to look at the number five until the next slide is presented."

Following the showing of Set C, the main room light was turned on and the Experimenter asked each Subject if they had any questions. All questions were answered as directly as possible without endangering crucial experimental variables (e.g., the timing of the viewing during Conditions A and B). It should be noted that at no time did the Experimenter attempt to conceal the fact that a camera was fixed to the side of the viewing apparatus, thus most subjects inquired about the purpose of the camera. They were told that it photographed the pupil of the eye while they were viewing the slides. If necessary the subjects were allowed to look through the view-finder in order to reassure them that only the pupil and not the entire face was being photographed.

RESULTS

The results were discussed in terms of the three operations which were utilized in this study to assess sexual interest. These operations were: (a) time of viewing slides of semi-nude males and females, (b) MMPI Mf scores, and (c) pupillary responses to slides of nude males and females.

1. Hypotheses One and Two: Married and Single males will look at slides of semi-nude females significantly longer than at slides of males, and Homosexual males will look significantly longer at slides of semi-nude males than females.

The mean time in seconds and standard deviations for each group under Condition A ("look at each slide as long as you are interested in it") is presented in Table 1. It can be seen that each of the means is in the predicted direction.

TABLE 1

Condition A: Mean time in seconds and standard deviations for viewing semi-nude pictures

Sample		male slides		female slides	
		$\bar{x}$	s	$\bar{x}$	s
Married males	N = 16	2.51	.56	4.04	1.57
Single males	N = 43	2.91	1.47	4.43	3.05
Homosexual males	N = 19	5.41	3.13	4.31	1.82

To test the significance of the differences between the means for male and female slides, a t test for correlated samples was computed for each group. The results are presented in Table 2.

TABLE 2

Condition A: Significance scores between mean differences in viewing time, semi-nude male-female picture.

Sample	N	t	p
Married males	16	4.63	.001*
Single males	43	3.80	.001*
Homosexual males	19	2.68	.02*

*two-tailed test

Inspection of Table 2 indicates that all groups demonstrated a significant difference in viewing slides of semi-nude males and females, all of these differences being in the predicted direction. The hypotheses that Married and Single males will look significantly longer at slides of semi-nude females and that Homosexual males will look significantly longer at slides of semi-nude males are clearly supported.

2. Hypotheses Three and Four: That Married and Single males, when asked to estimate time, will look longer than fifteen seconds at slides of semi-nude females and that Homosexual males will look longer than fifteen seconds

at slides of semi-nude males.

The mean time in seconds and standard deviations obtained under Condition B ("look at each slide for approximately fifteen seconds")for each group is presented in Table 3.

TABLE 3

Condition B: Mean time in seconds and standard deviation scores for viewing semi-nude slides.

Sample		male slides		female slides	
		$\bar{x}$	s	$\bar{x}$	s
Married males	N = 16	13.36	4.18	15.81	5.72
Single males	N = 43	13.75	5.30	15.21	6.39
Homosexual males	N = 19	15.34	6.04	12.97	3.96

The means for each of the groups are in the predicted direction.

A t test for correlated samples was computed to assess the significance of the differences between viewing time of semi-nude male and female slides for each of the groups. The results are presented in Table 4.

TABLE 4

Condition B: Significance scores between mean differences in viewing time, semi-nude male and female pictures.

Sample	N	t	p
Married males	16	6.44	.001*
Single males	43	5.09	.001*
Homosexual males	19	2.32	.05*

*two-tailed test

Hypotheses three and four are supported by the highly significant results. Thus Married and Single males look longer than fifteen seconds at slides of semi-nude females, and Homosexual males look significantly longer at slides of semi-nude males.

5. Hypothesis Five: There will be no significant difference between a sample of University Students and Homosexual Males on the basis of their raw scores on the Mf scale of the MMPI.

The mean Mf scores for each of the groups is presented in Table 5.

TABLE 5

		Mean Mf Scores
Married males	N = 16	25.81
Single males	N = 43	26.18
Homosexual males	N = 18	37.16

A t test for independent samples was utilized to assess the significance of the differences of these scores between the three groups. The results are reported in Table 6.

TABLE 6

Significance of differences of Mf Scores between each group

	x's			diff.	t	p
Married - single	25.81	-	26.18	.37	.29	>.05*
Single - homosexual	26.18	-	37.16	10.98	9.15	<.001*
Married - homosexual	25.81	-	37.16	11.35	8.59	<.001*

* two tailed test

On the basis of the samples used in this study, Homosexual males have a significantly higher Mf score than do Married males or Single males. Based on the mean Mf scores, the Married and Single males would obtain a score approximately one standard deviation above that for the general population. This is in accordance with mean scores on this scale reported for other college or University samples. The estimated T score for the Homosexual sample used in this study would place them approximately three standard deviations above the mean for the general population. Clearly, the hypothesis is not supported.

6. Hypotheses Six and Seven: Married and Single males will demonstrate a greater increase in mean pupillary diameter to slides of nude females, and Homosexual males will demonstrate a greater increase in mean pupillary diameter to slides of nude males.

The data regarding the pupillary response measure are presented for discussion both qualitatively and quantitatively. The male-female response measures based on measurement of the pupil for each of the three groups is presented in Table 11. Figures 1, 2, and 3 present the results of Column 3, Table 7 graphically for each of the three groups.

TABLE 7

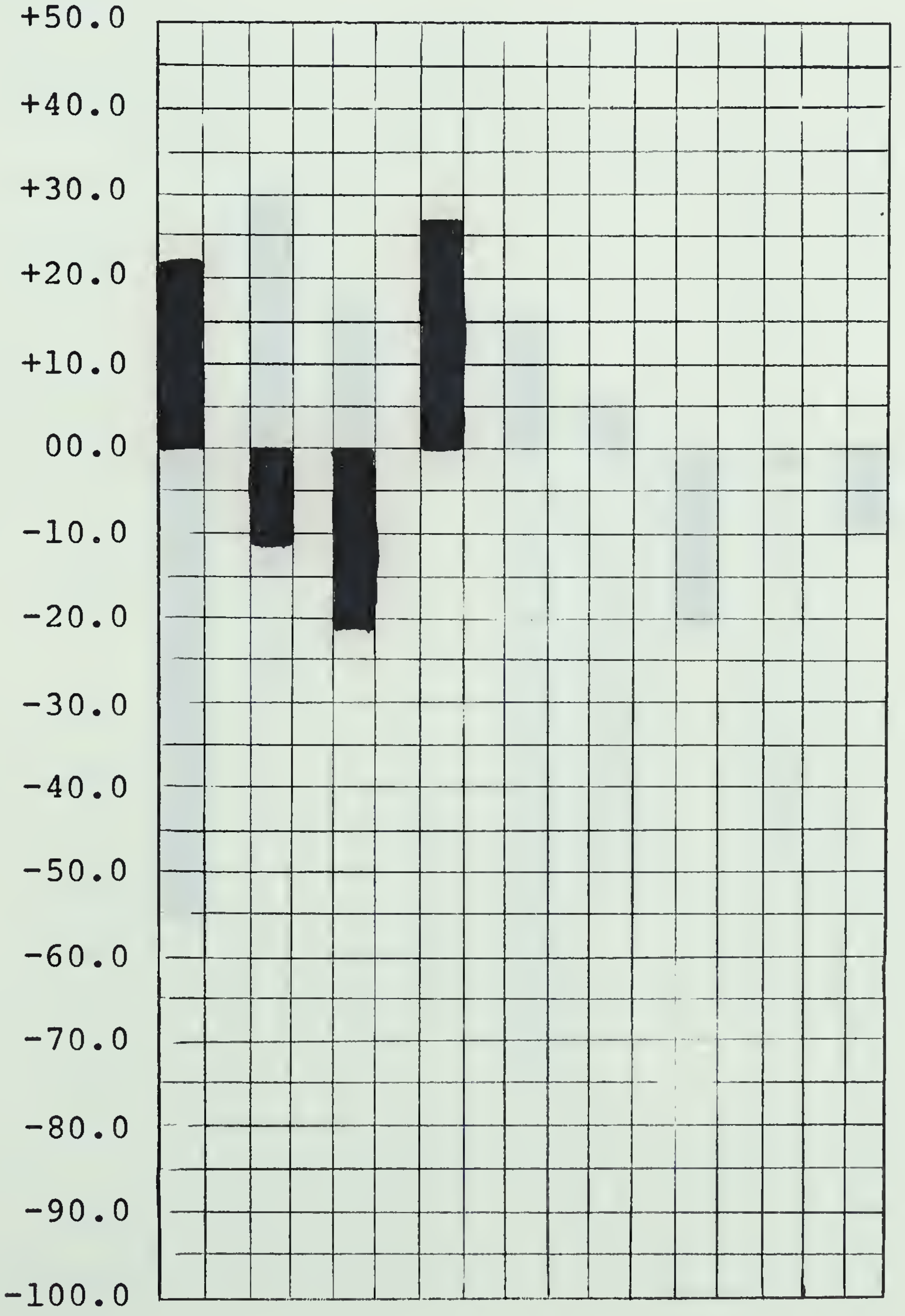
Pupil size increases or decreases when comparing stimuli to controls expressed in percentage totals

	Total response to male nudes (1)	Total response to female nudes (2)	Relative "male-female" response score (3)
Married males:			
1	+19.4	+39.5	+20.1
2	+48.9	+36.1	-12.8
3	+33.4	+10.8	-22.6
4	+39.2	+65.8	+26.6
Single males:			
1	+126.8	+71.9	-54.9
2	+19.0	+49.8	+30.8
3	+34.3	+51.5	+17.2
4	-9.6	+5.4	+15.0
5	+84.7	+99.6	+14.9
6	+57.3	+61.3	+4.0
7	+39.2	+10.8	-27.4
8	+46.8	+43.6	-3.2
9	+79.1	+69.9	-9.2
Homosexuals:			
1	+57.8	+51.8	-6.0
2	+42.8	+14.6	-28.2
3	+20.1	+5.5	-14.6
4	+23.3	+35.0	+11.7
5	+97.7	+22.7	-75.0
6	+53.4	+5.6	-47.8
7	+26.8	+24.2	2.6
8	+74.5	+25.6	-48.9

MARRIED MALES

Figure 1

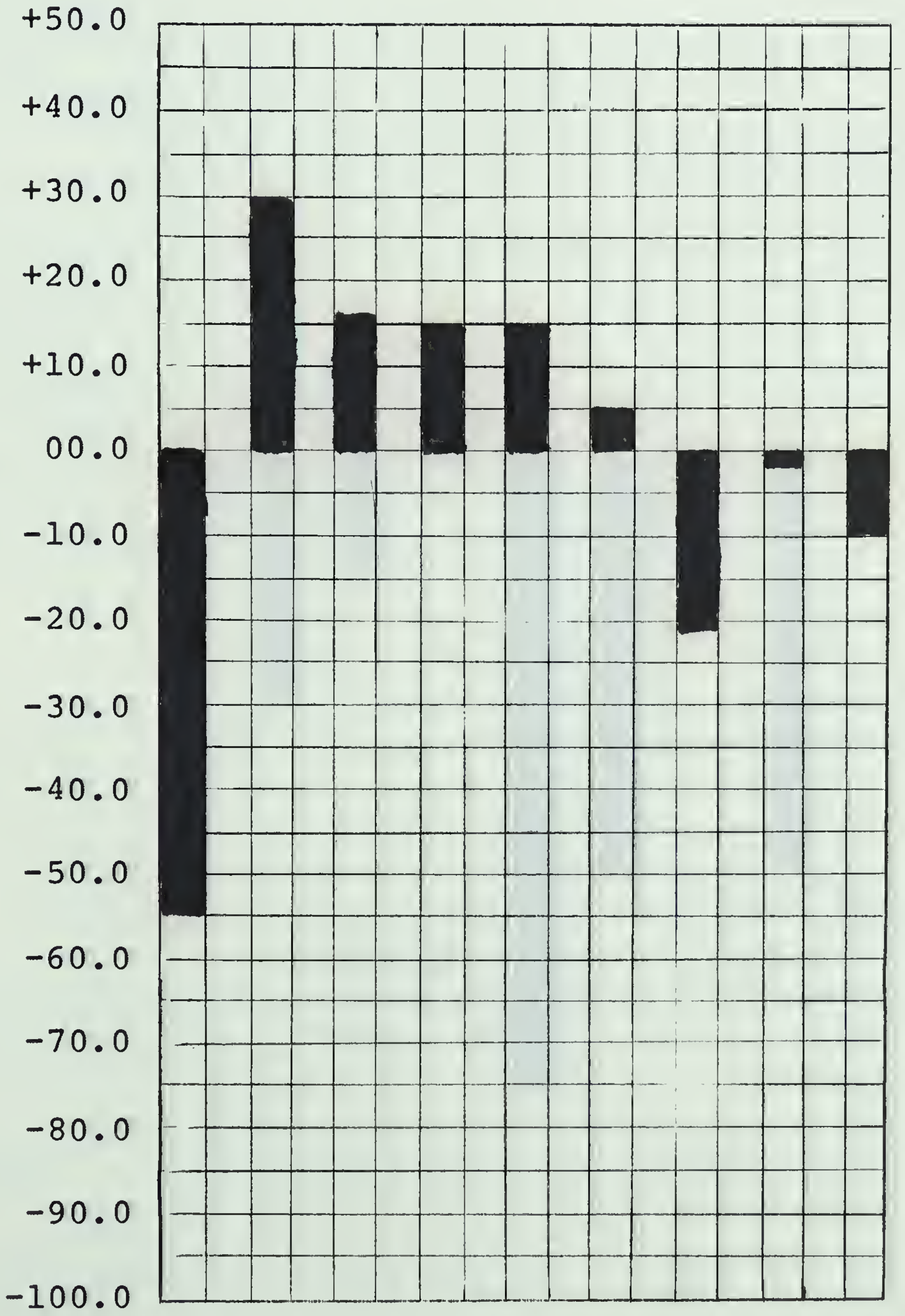
Differences in percentage of pupil size changes in response to male and female nudes. A positive score shows higher response to pictures of females; a negative score shows higher response to pictures of males.



SINGLE MALES

Figure 2

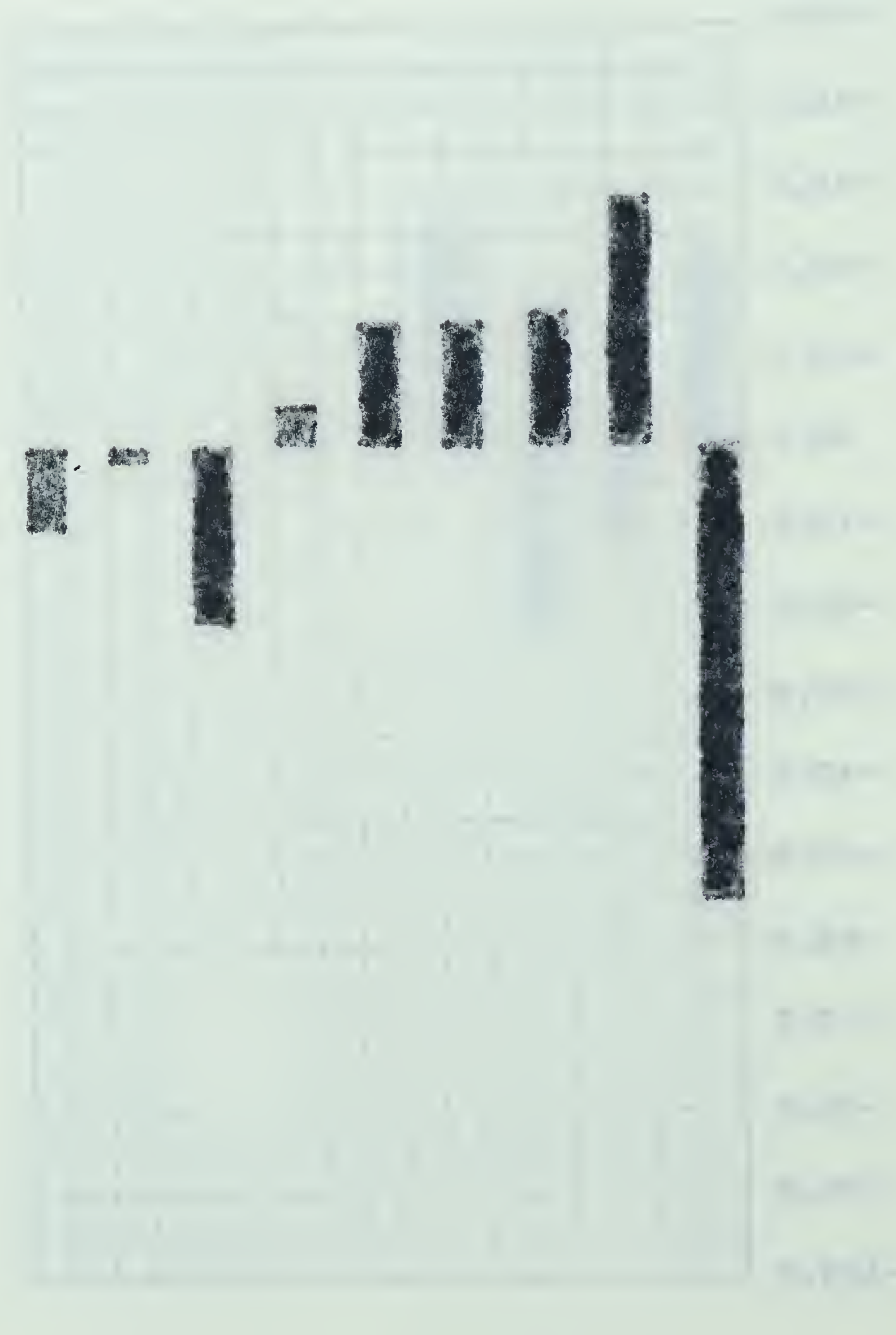
Difference in percentage of pupil size change in response to male and female nudes. A positive score shows higher response to pictures of females; a negative score shows higher response to pictures of males.



[illegible]

[illegible]

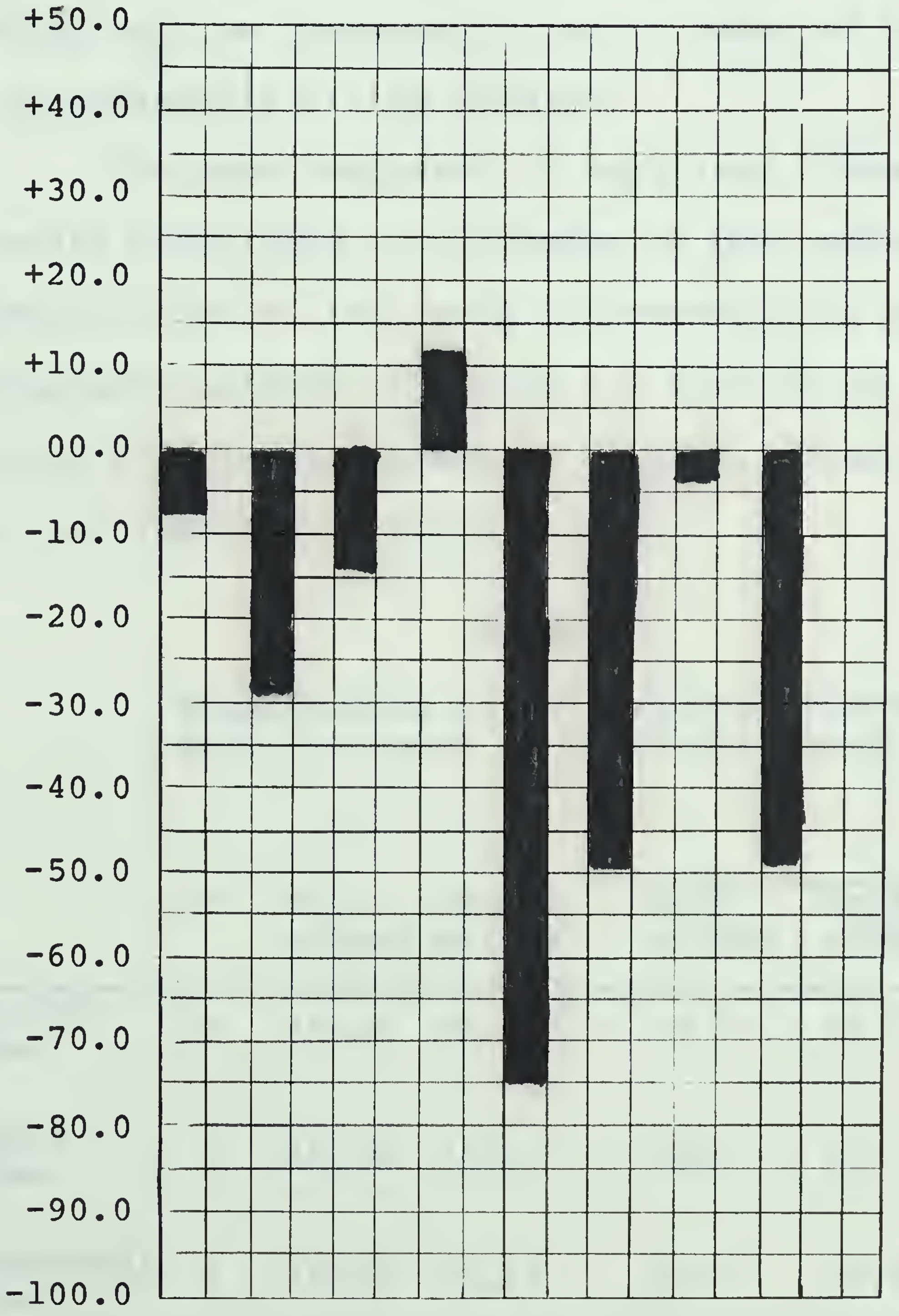
[illegible]



HOMOSEXUAL MALES

Figure 3

Difference in percentage of pupil size changes in response to male and female nudes. A positive score shows higher response to pictures of females; a negative score shows higher response to pictures of males. All subjects are presently exclusively homosexual.



Inspection of Table 7 reveals that the pupillary response to pictures of both males and females is quite dramatic and that all subjects respond to both types of stimuli. The Homosexual sample, although responding to pictures of female nudes, demonstrates a consistent and greater increase in mean pupillary diameter to the male nudes. The Married and Single males do not show the same consistency of response as the Homosexual sample. This finding will be discussed later in terms of the differences in heterogeneity of the samples.

The mean increases in pupillary diameter and standard deviations for pictures of both males and female nudes for each of the Group is presented in Table 8 . The differences between the means for each Group were computed using a t test for correlated samples. These results are also reported in Table 8 .

TABLE 8

Significance of Differences between Mean Increases in Pupillary Diameter

		$\bar{X}$	$\bar{X}$	s			
	N	Male slides	Female slides	Male slides	Female slides	t	s
Married Males	4	35.22	38.05	10.7	19.5	.23	$>.05$*
Single Males	9	55.08	51.53	34.6	27.9	.17	$>.05$*
Homosexual Males	8	49.55	23.12	25.4	14.4	2.59	$<.05$*

*two-tailed test

Significance is reached only by the Homosexual sample. The failure to reach significance by the Married and Single males is discussed later, again in terms of the heterogeneity of these samples.

DISCUSSION

A discussion of the results of this study could cover many variables. The author chooses to limit discussion to three of the major hypotheses, with most attention being given to the data regarding the pupillary response.

This study was intended to provide a methodological approach to the measurement of sexual interests using a strict operationism. Thus, sexual interest was defined in terms of "viewing time", MMPI _Mf_ scores, and pupillary responses to pictures of nude males and females.

With regard to the "time of viewing" variable, the hypotheses were clearly supported. This offers some support for Skinner's notion that interests can be measured by having the subject look at pictures of different content and recording the time spent in looking.

With regard to the scores on the _Mf_ scale of the MMPI, the difference between the Homosexual and Married and Single samples was large and significant, a finding contrary to the hypothesis. On the basis of at least two factors caution must be exercised in extrapolating these findings to the general population: (1) as noted in the procedure section, the MMPI was administered under different conditions for these groups, and (2) the fact that the Homosexuals were known to the author as homo-

sexuals would increase the probability of more self-revealing responses than might ordinarily be obtained. In other words, the Homosexual sample had nothing to lose by admitting to those items which might be associated with homoerotic behavior. Another relevant point is that within the University sample itself, there was no significant difference between Mf scores for males who stated no history of homosexual behavior and/or attraction in responding to the Behavior Questionnaire, and males who stated a history of such behavior.

The variable of most interest in this study was the pupillary response to pictures of nude males and females.

Inspection of Column 3, Table 7 indicates that the pupillary responses of the Homosexual sample were consistent and large. The Married and Single males did not demonstrate this consistency or magnitude of response. A possible explanation for this finding is that in terms of past sexual behavior, the Married and Single males were a much more heterogenous group than the Homosexual males.

In view of the variability of the pupillary response within and between subjects, no statement regarding the Orienting Response can be made with regard to the pictures of nude males and females. However with

regard to the Control slides two phenomena deserve consideration: (1) there appeared to be greater pupillary "play" or motion to the first two Control slides, after which adaptation appeared to occur to the Control slides and was quite stable for the remainder of the Control series. Thus, the first two presentations of the Control slide elicited more variability of the pupillary response but by the third presentation variability was extremely small, generally limited to no more than ± 1/10th of a millimeter. (2) an interesting phenomenon appeared after the presentation of the first two nude slides suggesting that the pupillary response could be conditioned. As the pupillary response to the Control slides of the nudes were measured an "anticipatory" dilation of the pupil began to appear at about the eight second interval. It appeared as if the pupil was beginning to "tell time" or to reflect the development of a time discrimination. This observation seems to be related to the behavior of pigeons working on a fixed-interval schedule of reinforcement where, following the reinforcement, there is a period of minimal responding which is followed by an increase in the rate of responding as the period of the next reinforcement approaches. Assuming that the nude pictures were reinforcing, the development of the anticipatory response does suggest that the pupillary response can be conditioned. This also suggests the need for further studies to establish

the parameters of an anticipatory response and its conditionability.

Inspection of Table 7, Column 3 demonstrates that with the exception of one Homosexual subject, the pupillary response can serve as an indicator of sexual preferences or interest. It should be noted that a subject could not be classified on the basis of the pupillary response to any one picture. Rather, classification was a function of total response to all of the pictures, both male and female.

As mentioned in the introduction to this study, Skinner has noted, with reference to operant behavior patterns that when one readily engages in a given activity, the effects of reinforcement but not "interest" are being displayed. On the other hand it can be argued that, at least in the case of the Homosexual sample, the pupillary response is an autonomic correlate of sexual interest and that the measured pupillary changes are an indication of the interest or lack of interest in a given stimulus.

Skinner would presumably disagree with the second explanation and suggest, as noted earlier, that the pupillary response does not reflect "interest" but rather the effects of reinforcement. This hypothesis would fit the data obtained from the Homosexual sample, but as a function of the lack of more detailed behavioral information is less clear with relation to the Married and Single males.

If the effects of reinforcement is being observed, considering the Skinnerian perspective further, then the individual responses of some of the subjects acquire some significance. For example, Homosexual Subject #4 was the only subject of this sample to have a history of heterosexual intercourse. He demonstrated a greater increase in mean pupillary diameter to nude females than to males. Considering the fact that while measuring the data we obtained some evidence that the pupillary response could be conditioned, it is suggested that sexual experiences which may be reinforcing and which occur at some critical period may condition the pupillary response to that particular situation or stimulus and that in the future that particular response will be elicited regardless of the current sexual orientation of the subject. Thus Married Subject #2 presents a history of both homosexual behavior and attraction. His homosexual experiences preceeded his heterosexual experiences, but heterosexual behavior predominates.

That a "critical period" type of phenomenon may be involved is not too unrealistic, especially when considered in the light of recent investigations of homosexuality (Bieber, et. al., 1958; Gebhard, et. al., 1965. Both of these studies have pointed out that when homosexuals are compared to other samples one finds a history of early onset of puberty, a large amount of prepubertal sex play,

(more homosexual than heterosexual) and in general a more sexually active childhood.

This study has demonstrated that the pupillary response is significantly correlated with current sexual orientation. Alternate explanations for this empirical fact are: (a) as an autonomic correlate of sexual interest; and (b) that the pupillary response is a conditioned respondent and which reflects the effects of reinforcement. Further research is suggested to investigate the conditionability of this response and its relationship to past behavioral history.

REFERENCES

Adler, F. H. Physiology of the eye. (3rd ed.) St. Louis: Mosby, 1959.

Anastasi, Anne. Psychological testing. (2nd ed.) New York: Macmillan, 1961.

Bieber, I., et. al. Homosexuality - a psychoanalytic study. New York: Basic Books, 1962.

Bieber, I. in Marmor, J. Sexual inversion: the multiple roots of homosexuality. New York, Basic Books, 1965.

Berlyne, D. E. Conflict, arousal and curiosity. Toronto: McGraw-Hill, 1960.

Dahlstrom, W. G. & Welsh, G. S. An MMPI handbook: a guide to use in clinical practice and research. Minneapolis: U. of Minnesota, 1960.

Davidson, B. Your eye can't lie. Sat. Eve. Post., Jan. 15, 1966.

Davson, H. (Ed.). The eye. New York: Academic Press, 1962.

Diamond, S. Personality and temperament. New York: Harper, 1957.

Gebhard, P. H., Gagnon, J. H., Pomeroy, W. B., & Christenson, Cornelia U. Sex Offenders - an analysis of types. New York: Harper & Row, 1965.

Hess, E. H., & Poet, J. M. Pupil size as related to interest value of visual stimuli. Science, 132, 1960, 349-350.

Hess, E. H. as reported in Los Angeles Times, September 7, 1964.

Hess, E. H. Attitude and pupil size. Scientific American, 212, No. 4, 1965 (a), 46-54.

Hess, E. H., Seltzer, A. L., & Shlien, J. M. Pupil response of hetero- and homosexual males to pictures of men and women: a pilot study. J. Abn. Psych., 70, No. 3, 1965 (b), 165-168.

Kinsey, A. C., Pomeroy, W. B. & Martin, C. E. Sexual behavior in the human male. Philadelphia: Saunders, 1948.

Razran, G. The observable unconscious and the inferable conscious in current soviet psychophysiology: interoceptive conditioning, sematic conditioning, and the orienting reflex. Psychol. Rev., 68, 1961, 109-119.

Skinner, B. F. *Science and human behavior*. New York: Macmillan, 1953.

Zamansky, H. S. A technique for assessing homosexual tendencies. J. Pers., 24, 1956, 436-448.

Zamansky, H. S. An investigation of the psychoanalytic theory of paranoid delusions. J. Pers., 26, 1958, 410-425.

APPENDIX A

Due to the fact that a large number of students have signed up for participation in my study, it is necessary to contact you by means of this form letter which the undersigned hopes you will excuse.

The primary purpose of this letter is to provide you with as much information regarding this study as is possible at this time, with the understanding that upon completion of the study all participants will be given a complete description of the purposes and results of the study.

First, participation in the study will provide you with five of the six hours of subject experimentation credit which is required for Psychology 202, although the total time involved in this study will be less than five hours.

Second, this study is composed of four stages. Before each stage each participant will be told exactly what is required and if he so chooses he may withdraw from the study, receiving credit for the stages which he has completed. It should be emphasized that AT NO TIME will any participant be subjected to any physical stress, or any stress which might harm a person either physically or psychologically.

Third, your anomymity is guaranteed AT ALL TIMES and this will begin with Stage One, at which time you will receive a code number which will be your only identification through and after the study is completed.

The credits which have been established for this study are as follows:

Stage One	2 credits
Stage Two and Three	1 credit
Stage Four	2 credits

Stage One will involve the administration of two psychological tests. Because of the number of people involved, the tests will be administered during an evening hour.

Attached to this letter is a form and an envelope. On this form please print your name and indicate by

checking the appropriate box which evening you would be able to participate in Stage One.

The tests will be administered in Room 32, basement of the Arts Building at 7.00 p.m. on the dates indicated.

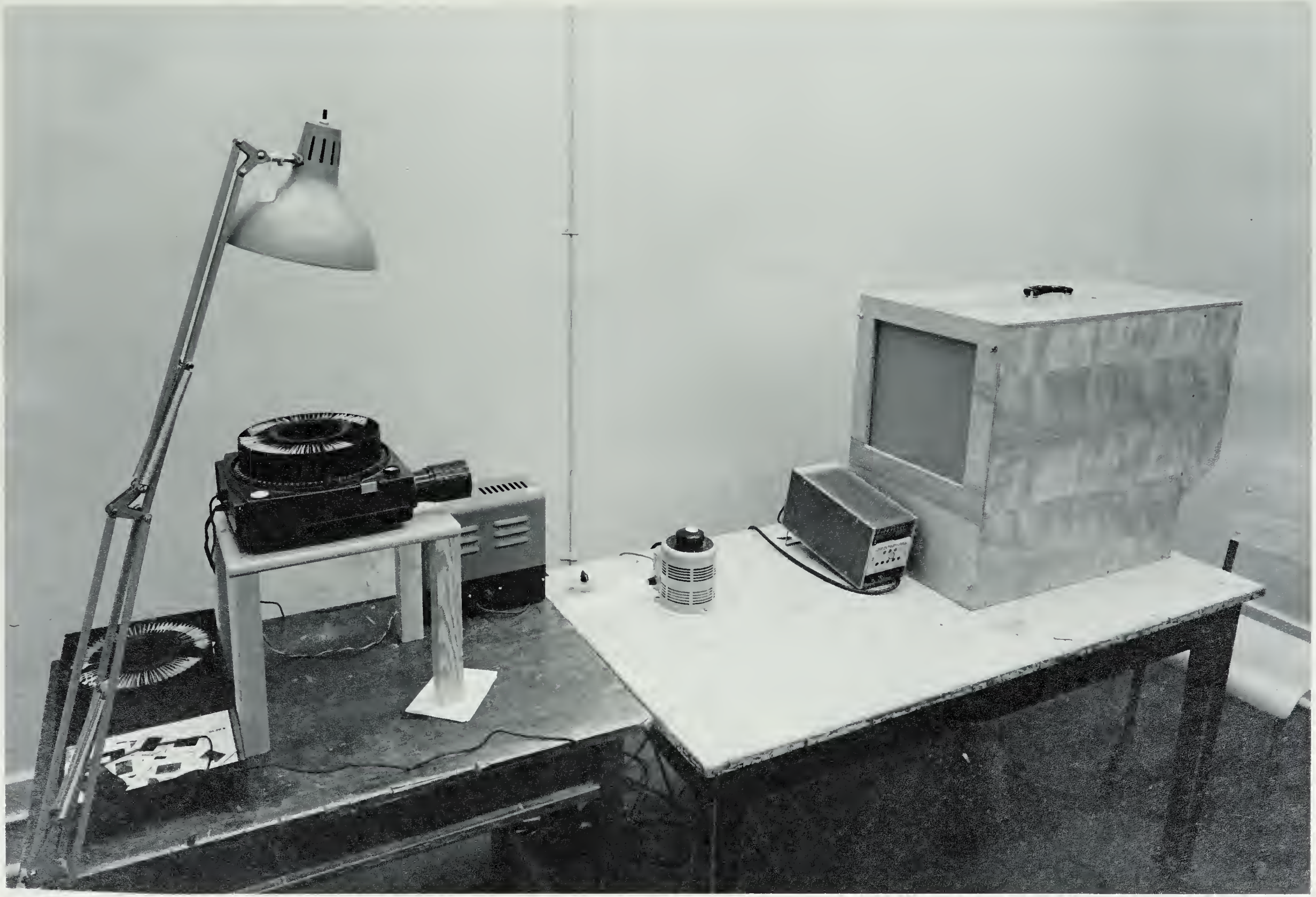
I would appreciate it if you would please return this form immediately in the enclosed envelope.

Sincerely,

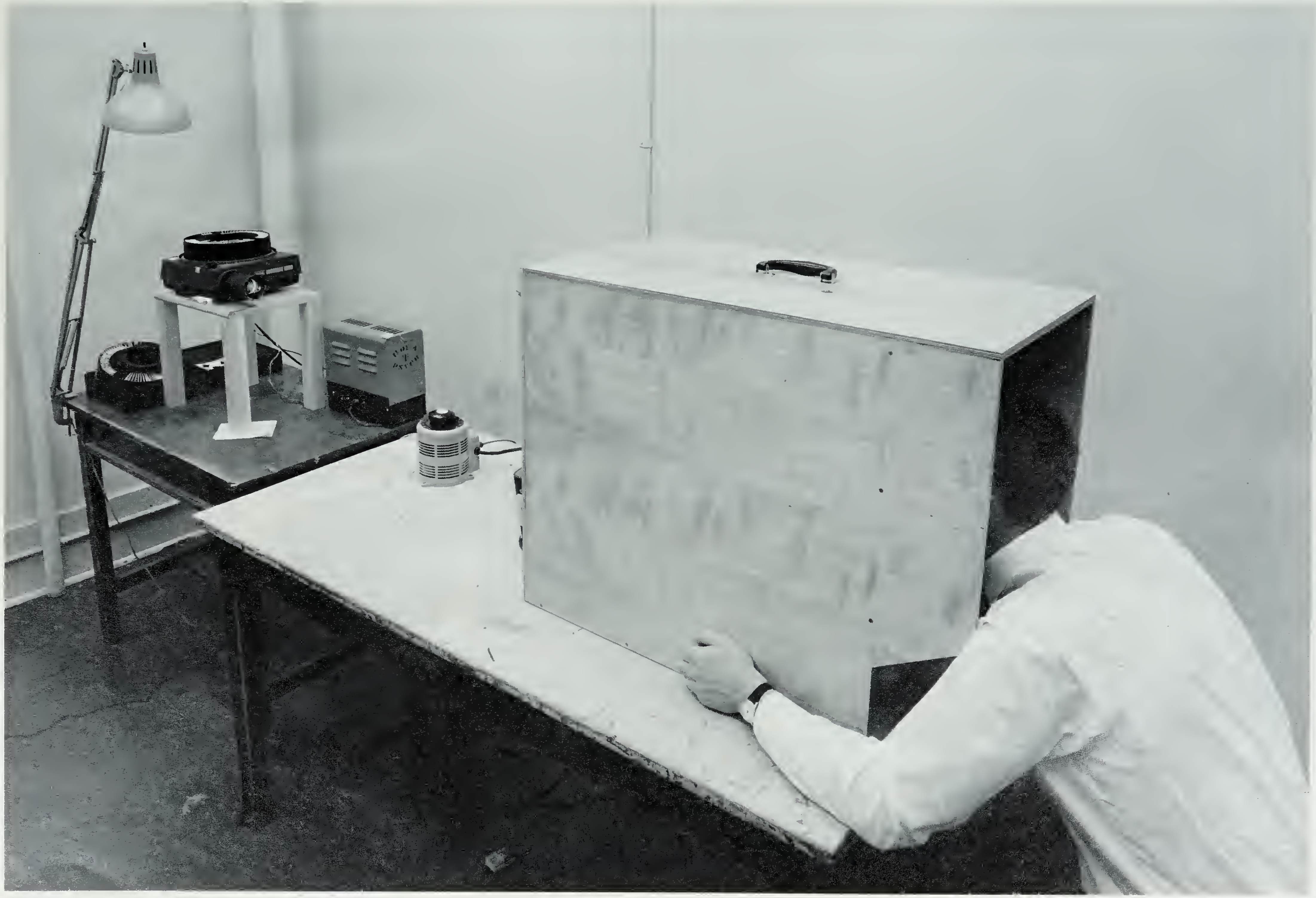
Albert B. Valle

APPENDIX B

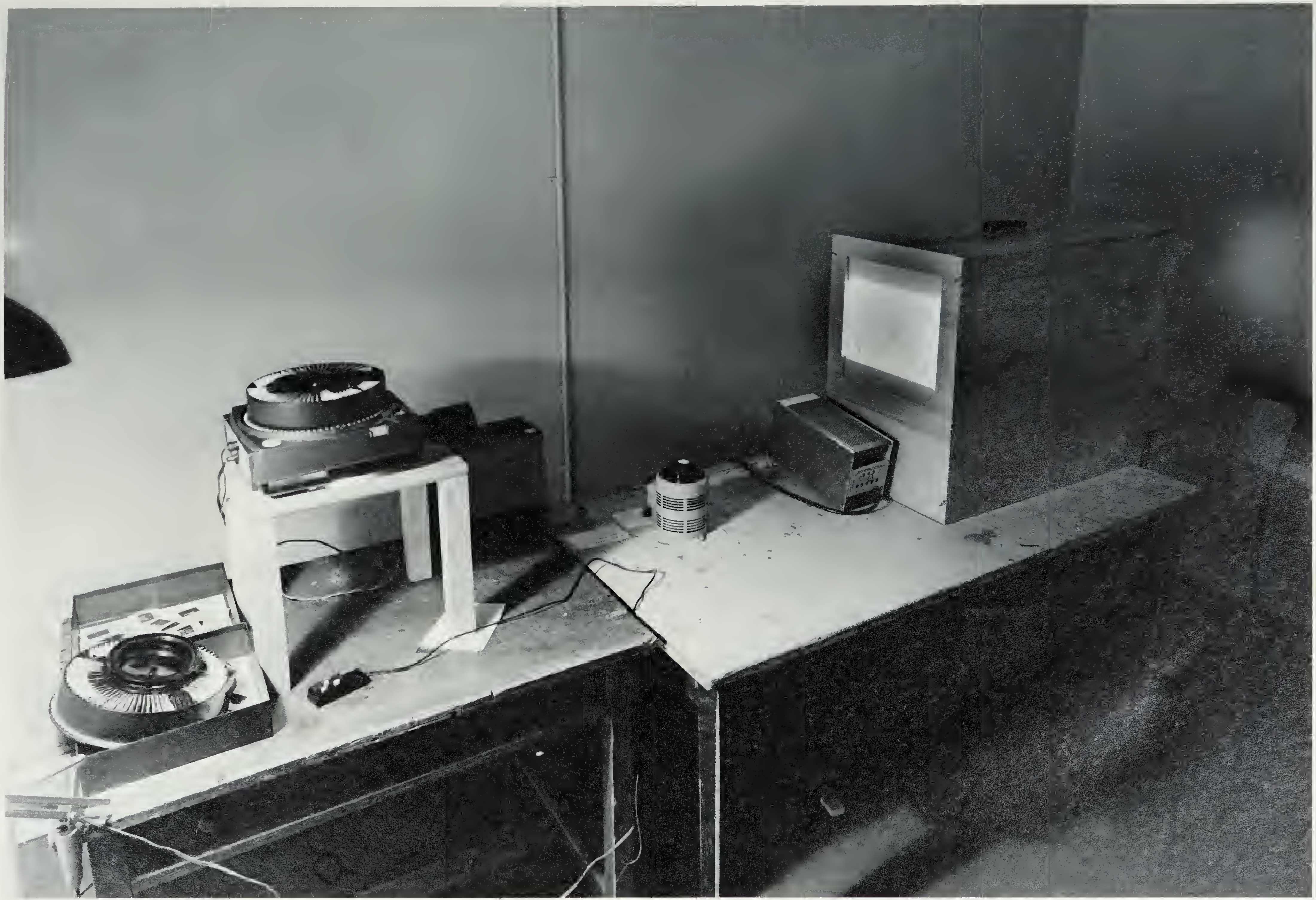
PHOTOGRAPHS OF VIEWING APPARATUS



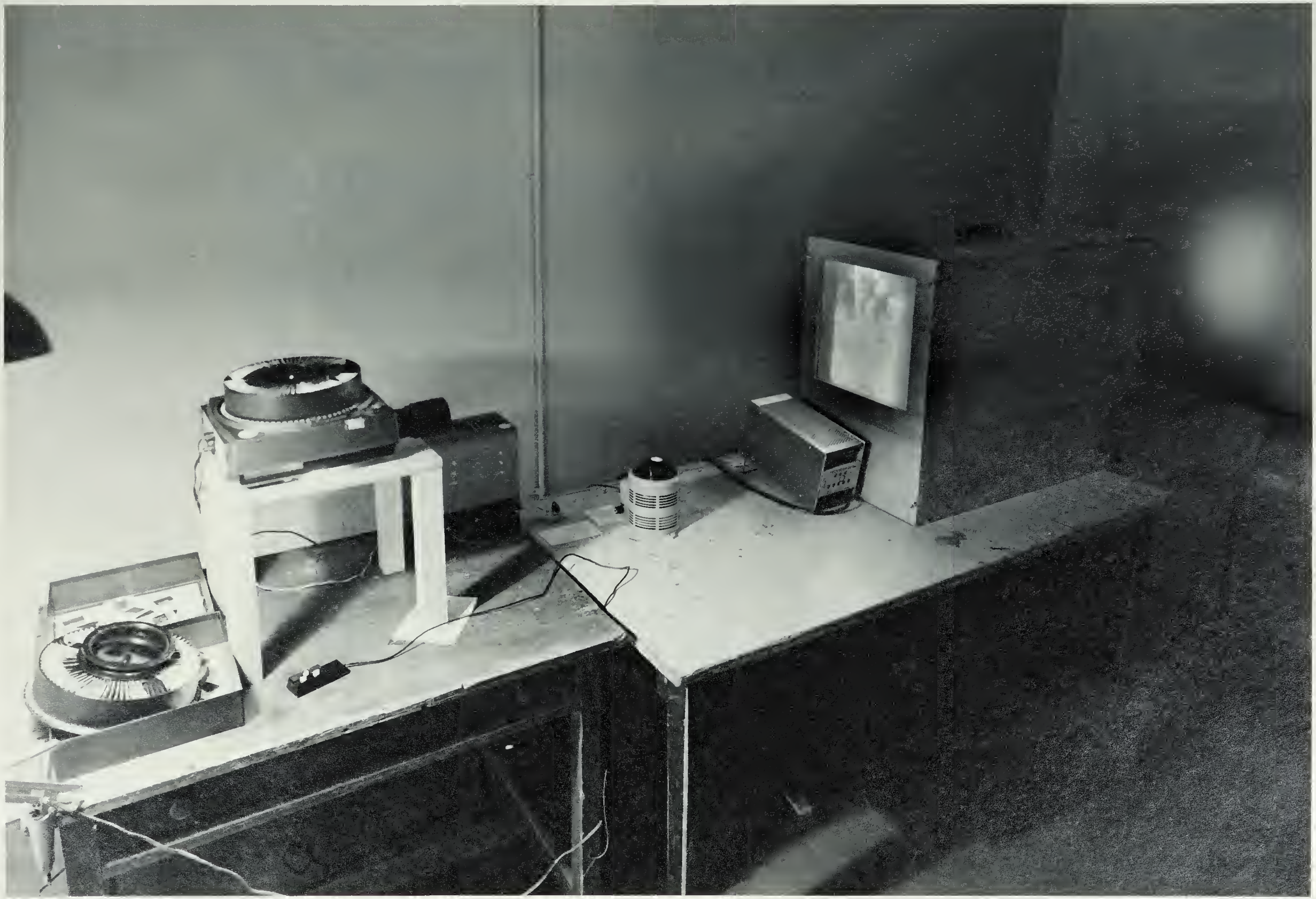
Experimental Apparatus View A



Experimental Apparatus View B



Experimental Apparatus View C



Experimental Apparatus View D

66 245-2

APPENDIX C

SET A

Number	Slide Content
A1	Female, standing, rear view, nude
A2	Male, standing, rear view, nude
A3	Female, sitting, frontal view, partially clothed
A4	Female, standing, frontal view, breasts and abdomen visible
A5	Male, standing, frontal view, bathing suit
A6	Female, standing, side view, partially clothed
A7	Male, side view, kneeling, no clothes
A8	Male, standing, frontal view, bathing suit
A9	Female, side-frontal, kneeling, partially nude
A10	Male, standing, frontal view, bikini brief
A11	Female, lying, breasts visible
A12	Male, side-frontal, sitting, covered with towel
A13	Female, lying in bed, partially clothed, one breast visible
A14	Male, frontal view, standing, posing strap
A15	Male, standing, frontal view, bikini brief
A16	Female, lying in bed, breasts visible
A17	Male, lying in bed, nude but genitals not visible
A18	Female, frontal view, standing, clothed with blouse open, breasts visible
A19	Female, frontal view, kneeling, breasts visible
A20	Male, rear view, standing, nude
A21	Female, frontal view, standing, slacks but no blouse, breasts visible
A22	Male, frontal view, sitting, posing strap
A23	Male, rear view, standing, nude
A24	Female, standing, side view, breasts visible
A25	Female, frontal view, standing, undressing with bra and panties still on
A26	Male, frontal view, standing, bathing suit
A27	Male, frontal view, standing, posing strap
A28	Female, rear view, standing, reflection of breasts in mirror
A29	Female, standing, side view, breasts visible
A30	Male, frontal view, sitting, jeans open at top

APPENDIX D

Set B

Slide Number	Slide Content
B1	Control
B2	Outdoors, mountains
B3	Control
B4	Outdoors, bridge and mountains
B5	Control
B6	Outdoors, mountains and glaciers
B7	Control
B8	Female, frontal nude, standing, outdoors
B9	Control
B10	Male, frontal nude, standing, outdoors
B11	Control
B12	Female, frontal nude, outdoors
B13	Control
B14	Female, frontal nude, lying, indoors
B15	Control
B16	Male, frontal nude, sitting, indoors
B17	Control
B18	Female, frontal nude, standing, outdoors
B19	Control
B20	Male, frontal nude, standing, indoors
B21	Control
B22	Female, frontal nude, standing, outdoors
B23	Control
B24	Male, frontal nude, outdoors
B25	Control
B26	Female, frontal nude, lying, outdoors
B27	Control
B28	Male, frontal nude, lying, outdoors
B29	Control
B30	Male, frontal nude, sitting, indoors

APPENDIX E

Set C

Slide Number	Slide Content
C1	Control
C2	Outdoors, mountains
C3	Control
C4	Outdoors, mountains and river
C5	Control
C6	Outdoors, mountains and river
C7	Control
C8	Male, frontal nude, standing, outdoors
C9	Control
C10	Female, frontal nude, kneeling, outdoors
C11	Control
C12	Female, frontal nude, outdoors
C13	Control
C14	Male, frontal nude, indoors
C15	Control
C16	Male, frontal nude, standing, outdoors
C17	Control
C18	Female, frontal nude, outdoors
C19	Control
C20	Male, frontal nude, standing, outdoors
C21	Control
C22	Female, frontal nude, outdoors
C23	Control
C24	Female, frontal nude, outdoors
C25	Control
C26	Male, frontal nude, lying, outdoors
C27	Control
C28	Female, frontal nude, sitting, outdoors
C29	Control
C30	Male, frontal nude, sitting, indoors

APPENDIX F

Please read each of the following statements carefully. When you have finished reading ALL of the statements place a circle around the number and the letter of the statement(s) which best describe(s) your actual sexual experiences as indicated in the statement of your psychological reaction to sexual stimuli. YOU SHOULD CIRCLE AS MANY OF THE STATEMENTS AS APPLY TO YOU.

Please note that you are asked to respond NOT on the basis of the number of sexual experiences of a particular type or kind, but rather you should respond on the basis of the RELATIVE FREQUENCY of one type of sexual experience as compared to another type, or one kind of psychological reaction to sexual stimuli as compared to another type.

0. Place a circle around the "0" if you have never had any physical sexual contact resulting in either sexual arousal or orgasm with a member of the same sex.

A. Place a circle around the "A" if you have never been physically attracted to members of your own sex.

1. Place a circle around the "1" if you have ever had physical contact with a member of the same sex resulting in either sexual arousal or orgasm.

B. Place a circle around the "B" if you have ever been psychologically aroused or attracted to a member of the same sex.

2. Place a circle around the "2" if you have ever had more than just an incidental sexual experience leading to arousal or orgasm with a member of the same sex BUT your sexual experience with members of the opposite sex has exceeded the above experiences.

C. Place a circle around the "C" if you have had more than just an incidental psychological attraction to a member of the same sex BUT this attraction is surpassed by the attraction to members of the opposite sex.

3. Place a circle around the "3" if you have had sexual experiences leading to arousal or orgasm with members of the same sex. BUT in addition your sexual experiences with members of the opposite sex leading to arousal or orgasm have been just as frequent, and you enjoy both types of sexual experiences equally.

D. Place a circle around the "D" if you are equally attracted towards members of the same and opposite sex.

4. Place a circle around the "4" if you have had more sexual experiences leading to arousal or orgasm with members of the same sex BUT you still have a fair amount of sexual experience with members of the opposite sex.

E. Place a circle around the "E" if you have more psychological attraction to members of the same sex than of the opposite sex BUT you still have a fair amount of psychological attraction to members of the opposite sex.

5. Place a circle around the "5" if your sexual experiences leading to arousal or orgasm have been almost entirely with members of the same sex even though you may have an occasional sexual experience with members of the opposite sex.

F. Place a circle around the "F" if you are psychologically attracted to members of the same sex almost entirely even though you may have an occasional psychological attraction to members of the opposite sex.

6. Place a circle around the "6" if your sexual experiences leading to arousal or orgasm have been entirely with members of the same sex.

G. Place a circle around the "G" if you are psychologically attracted to members of your own sex entirely.

(In the space below you may add any comments you wish regarding the above statements or your responses to these statements).

B29858